IN THE CLAIMS

Claims 4, 8, 9, 33-36, 40 and 45 have been canceled without prejudice. Claims 1-3, 6, 7, 13-16, 18, 20-23, 30-32, 37-39, 42 and 44 have been amended. New claims 46-72 have been added. The italicized claims are the remaining claims which have not been amended in this Response and are provided for the Examiner's reading convenience.

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1. (Amended) An apparatus to deliver a therapeutic agent to a vessel, comprising:

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an elongated source of a therapeutic agent, the source having gradients of therapeutic agent concentrations along a length of the elongated source near a proximal end and a distal end of the elongated source.

2. (Amended) The apparatus of claim 1 wherein the gradients comprise therapeutic agent concentrations gradually decreasing along the length of the elongated source.

3. (Amended) The apparatus of claim 1 wherein the source comprises a radioactive intravascular stent or a drug eluting stent.

Please cancel Claim 4.

5. *The apparatus of claim 1 wherein the source comprises a drug delivery stent having an anti-cell proliferation drug for treatment of the vessel.*

6. (Amended) An apparatus for delivering therapeutic radiation to a vessel, comprising:

an elongated radiation delivery source including a radioactive region thereon, the radioactive region having a proximal end and a distal end, and being capable of delivering a therapeutic level of radioactivity, wherein the radioactive region includes a region of a radioactive gradient transitioning from the therapeutic level to a non-therapeutic level of radioactivity near the proximal end and the distal end of the radioactive region.

7. (Amended) The apparatus of claim 6 wherein the radiation delivery source comprises an intravascular stent.

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Please cancel Claims 8 and 9.

10. *The apparatus of claim 6 wherein the radioactive region comprises a beta particle emitting isotope.*

11. *The apparatus of claim 6 wherein the radioactive region comprises a gamma particle emitting isotope.*

12. *The apparatus of claim 6 wherein the radioactive region comprises a beta particle and a gamma particle emitting isotope.*

13. (Amended) A method of producing a radioactive delivery source, comprising:

forming a radioactive region on a radioactive delivery source, the radioactive region having a proximal end and a distal end, and being capable of delivering a therapeutic level of radioactivity between the proximal end and the distal end; and

forming radioactivity gradients within the radioactive region near the proximal end and the distal end of the region, the radioactivity gradients transitioning from the therapeutic level of radioactivity to a non-therapeutic level of radioactivity.

14. (Amended) The method of claim 13 wherein forming the radioactivity gradients comprises uniformly decreasing the radioactivity level from the therapeutic level to the non-therapeutic level.

15. (Amended) The method of claim 13 wherein forming the radioactivity gradients comprises variably decreasing the radioactivity level from the therapeutic level to the non-therapeutic level.

16. (Amended) The method of claim 13 wherein forming the radioactivity gradients comprises decreasing the radioactivity level by incremental steps from the therapeutic level to the non-therapeutic level.

17. *The method of claim 13 wherein forming the radioactive region comprises coating the delivery source with isotopes by ion beam implantation.*

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18. (Amended) The method of claim 17 wherein forming the radioactivity gradients comprises gradually decreasing an ion beaming time.

19. *The method of claim 13 wherein forming the radioactive region comprises coating the delivery source with isotopes by plasma implantation.*

20. (Amended) The method of claim 19 wherein forming the radioactivity gradients comprises masking the proximal end and the distal end of the radioactive region with radioactivity shields.

21. (Amended) An intravascular stent for delivering therapeutic radiation to a vessel, comprising:

a radioactive region along an elongated length of a stent, the radioactive region having an area capable of delivering a substantially uniform dose of radioactivity to a vessel localized near a central portion of the stent, wherein the radioactive region includes radioactivity gradients near a proximal end and a distal end of the radioactive region, the radioactivity gradients gradually decreasing the dose delivered to the vessel from a therapeutic level to a non-therapeutic level of radioactivity, and wherein the gradients decrease the dose from a point inward of the proximal end to or near the proximal end, and decrease the dose from a point inward of the distal end to or near the distal end of the radioactive region.

22. (Amended) The stent of claim 21 wherein the radiation dose delivered to the vessel inhibits vessel cell proliferation along the elongated length of the stent and past the proximal end and the distal end of the stent.

23. (Amended) The stent of claim 21 wherein the area capable of delivering the substantially uniform level of radioactivity comprises a greater longitudinal length than each of

the gradients.

24. *The stent of claim 21 wherein the gradients comprise a uniform rate of decrease of radioactively level.*

25. *The stent of claim 21 wherein the gradients comprise a variable rate of decrease of radioactivity level.*

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27. *The stent of claim 21 wherein the radioactive region comprises a beta particle emitting isotope.*

28. *The stent of claim 21 wherein the radioactive region comprises a gamma particle emitting isotope.*

29. *The stent of claim 21 wherein the radioactive region comprises a beta and a gamma emitting particle isotope.*

30. (Amended) The stent of claim 21 wherein the dose of radioactivity comprises up to 60 Gray.

31. (Amended) An intravascular stent for delivering a drug to a vessel, comprising:

a drug delivery region along a surface of an elongated length of a stent, the drug delivery region having a variable drug concentration thereon, wherein the drug delivery region includes an area of substantially uniform drug concentration localized near a central portion of the stent, and wherein the drug delivery region includes drug concentration gradients near a proximal end and a distal end of the stent, the drug concentration gradients gradually decreasing from a therapeutic dose level to a non-therapeutic dose level, and wherein the gradients decrease from a point inward of the proximal end to or near the proximal end, and decrease from a point inward of the distal end to or near the distal end of the drug delivery region.

32. (Amended) The stent of claim 31 wherein the drug dose delivered to the vessel inhibits vessel cell proliferation along the elongated length of the stent and past the proximal end and the distal end of the stent.

Please cancel Claims 33-36.

37. (Amended) A method of producing a drug source, comprising:

forming a drug region on a drug source, the drug region having a proximal end and a distal end, and having a therapeutic level of drug concentration between the proximal end and the distal end; and

forming drug concentration gradients within the drug region near the proximal end and the distal end of the drug region, the concentration gradients transitioning the drug concentration from the therapeutic level of drug concentration to a non-therapeutic level of drug concentration.

38. (Amended) The method of claim 37 wherein forming the drug concentration gradients within the drug region comprise uniformly decreasing the drug concentration from the therapeutic level to the non-therapeutic level.

39. (Amended) The method of claim 37 wherein forming the drug concentration gradients within the drug region comprises variably decreasing the drug concentration from the therapeutic level to the non-therapeutic level.

Please cancel Claim 40.

41. *The method of claim 37 wherein forming the drug region comprises dipping the drug source in a drug.*

42. (Amended) The method of claim 41 wherein forming the drug concentration gradients within the drug region comprises masking the proximal end and the distal end of the drug region.

43. *The method of claim 37 wherein forming the drug region comprises coating the*

drug source with a drug.

44. (Amended) The method of claim 43 wherein forming the drug concentrations gradients within the drug region comprises varying a translational drug spraying speed.

Please cancel Claim 45.

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Please add the following new claims:

46. (New) A stent to deliver a therapeutic agent to a biological lumen, comprising a body and a therapeutic agent deposited on the body of the stent, wherein the concentration or amount of therapeutic agent gradually changes along a length of the stent.

47. (New) The stent of Claim 46, wherein the therapeutic agent is a radioactive substance.

48. (New) The stent of Claim 46, wherein the therapeutic agent is a drug.

49. (New) The stent of Claim 48, wherein the drug is disposed in a polymeric coating.

50. (New) The stent of Claim 46, wherein the concentration or amount of therapeutic agent gradually decreases from an area within a middle segment of the stent towards an end of the stent.

51. (New) The stent of Claim 46, wherein the concentration or amount of therapeutic agent changes at a constant rate along the length of the stent.

52. (New) The stent of Claim 46, wherein the concentration or amount of therapeutic agent changes incrementally along the length of the stent.

53. (New) A method of producing a stent, comprising depositing a therapeutic agent onto a body of a stent, wherein the amount or concentration of the therapeutic agent deposited onto the body gradually changes along a length of the stent.

54. (New) The method of Claim 53, wherein the therapeutic agent is a radioactive substance.

55. (New) The method of Claim 53, wherein the therapeutic agent is a drug.

56. (New) The method of Claim 53, wherein the drug is disposed in a polymeric coating.

57. (New) The method of Claim 53, wherein the length is a segment of the stent in close proximity to one end of the stent.

58. (New) The method of Claim 53, wherein the length is defined as any segment along a longitudinal length of the stent.

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59. (New) The method of Claim 53, wherein the therapeutic agent is deposited so that the concentration or amount gradually decreases from an area within a middle segment of the stent towards an end of the stent.

60. (New) The method of Claim 53, wherein the therapeutic agent is deposited so that the concentration or amount changes at a constant rate along the length of the stent.

61. (New) The method of Claim 53, wherein the therapeutic agent is disposed in a polymeric coating and the length is defined as any segment of the coating extending longitudinally from a first segment of the stent to a second segment of the stent.

62. (New) The method of Claim 53, wherein the therapeutic agent is deposited so that the concentration or amount changes in incremental segments along the length of the stent.

63. (New) A drug eluting stent, comprising:

a body having a first end and a second end and a middle segment between the first and second ends; and

a drug deposited on the stent, wherein the middle segment of the stent has more of the drug than the first or second end of the stent.

64. (New) The stent of claim 63, wherein the drug is deposited in a polymeric coating.

65. (New) A drug eluting stent, comprising:

a body having a first end and a second end and a middle segment between the first and second ends; and

a drug deposited along the middle segment of the stent, wherein the first or second end of the stent is free from any drug.

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66. (New) The stent of Claim 65, wherein one of the first or second ends includes a drug deposited thereon.

67. (New) A stent comprising a body having a first end, a second end and a middle segment, wherein a concentration of a drug carried by the stent is greater at the middle segment of the stent as compared to the first or second end.

68. (New) The stent of claim 67, wherein the drug is carried by a polymeric coating.

69. (New) A method of forming a coating on a stent, the stent comprising a body having a first end, a second end and a middle segment, the method comprising applying a composition having a drug to a selected portion of the stent, wherein the concentration of the drug in the coating is greater at the middle segment as compared to the first or second end.

70. (New) A method of producing a medicated stent, the stent comprising a first end, an opposing second end, and a middle segment between the two ends, the method comprising depositing a drug along the middle segment of the stent, wherein the two ends are free from any drug.

71. (New) A method of producing a medicated stent, the stent comprising a first end, an opposing second end, and a middle segment between the two ends, the method comprising depositing a drug along the middle segment of the stent, wherein at least one of the two ends has less drug than the middle segment.

72. (New) The method of Claim 71, wherein both ends have less drug than the middle segment.